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HIV Testing Among Pregnant Women—United States and Canada, 1998-2001

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3 tables omitted

SINCE 1994, THE AVAILABILITY OF INcreasingly effective antiretroviral drugs for both the prevention of perinatal human immunodeficiency virus (HIV) transmission and maternal treatment has resulted in a greater emphasis on prenatal HIV testing and substantial increases in prenatal testing rates. In 2000, preliminary data indicated that 766 (93%) of 824 HIV-infected women in 25 states knew their HIV status before delivery (CDC, unpublished data, 2002). However, an estimated 280-370 perinatal HIV transmissions continue to occur in the United States each year.[1] The primary strategy to prevent perinatal HIV transmission is to maximize prenatal HIV testing of pregnant women. States and Canadian provinces have implemented three different prenatal HIV-testing approaches. To assess their effectiveness, CDC reviewed prenatal HIV-antibody testing rates associated with these approaches. Medical record data suggest that the "opt-in" voluntary testing approach is associated with lower testing rates than either the "opt-out" voluntary testing approach or the mandatory newborn HIV testing approach.

Under the opt-in approach, women typically are provided pre-HIV test counseling and must consent specifically to an HIV-antibody test. Under the opt-out approach, women are notified that an HIV test will be included in a standard battery of prenatal tests and procedures and that they may refuse testing.[2] Under mandatory newborn HIV testing, newborns are tested for HIV, with or without the mother's consent, if the mother's HIV status is unknown at delivery.

Three methods were used to estimate prenatal testing rates among all women who delivered, regardless of whether they received prenatal care. First, eight U.S. areas that participated during 1998-1999 in CDC's Active Bacterial Core Surveillance/Emerging Infections Program (ABC) Network assessed HIV testing during prenatal care and ≤2 days before delivery by reviewing a stratified random sample of labor and delivery records and prenatal records forwarded to birthing hospitals[3]; in collaboration with CDC, network staff received a sample of records from all birthing hospitals in the surveillance areas and weighted testing rates to represent all live-born infants in those areas. Second, public health investigators in each of the five Canadian provinces tallied the number of HIV tests among pregnant women that were submitted to provincial laboratories and divided the total by an estimate of all live and stillborn births in each province during the same year. Third, CDC analyzed weighted data collected in 1999 by interviewers in nine states for CDC's Pregnancy Risk Assessment Monitoring System (PRAMS) (an ongoing, population-based survey conducted in 32 states and New York City among women who have given birth during the preceding 2-6 months[4]), who had asked women if they had been tested for HIV during pregnancy. Data on state prenatal HIV-testing policies were obtained from the American College of Obstetricians and Gynecologists.[5]

HIV-testing rates varied depending on which approach to testing was used. Rates for states using the opt-in approach to prenatal HIV testing included in the ABC Network ranged from 25% to 69%, testing rates in Canada ranged from 54% to 83%, and rates derived from PRAMS data ranged from 61% to 81%. Two U.S. states (Arkansas and Tennessee) and two Canadian provinces (Alberta, and Newfoundland and Labrador) reported using an opt-out prenatal HIV-testing policy. ABC Network data indicated that Tennessee had a testing rate of 85%. Canada's population-based data indicated a 98% testing rate in Alberta and a 94% testing rate in Newfoundland and Labrador. PRAMS interview data indicated a 71% testing rate in Arkansas, compared with a 57% testing rate early in 1997 before the law was implemented (Arkansas Department of Health, personal communication, 2002). Two states (New York and Connecticut) require HIV testing of newborns whose mothers were not tested during pregnancy. In New York, an ABC Network review of medical records in seven counties in the Rochester area indicated that the proportion of pregnant women who received a prenatal HIV test increased from 52% of 438 charts during January 1998–July 1999 to 83% of 112 charts during August-December 1999 after New York required that newborn HIV testing results be made available within 48 hours of specimen collection. PRAMS data for 1999 indicated that the proportion of women statewide who reported having received an HIV test during pregnancy increased from 69% of 758 women during January-July to 93% of 502 during August-December. In separate, statewide analyses of prenatal testing reported on newborn metabolic screening forms from all live-born infants, New York reported prenatal HIV-testing rates of 89% in 2000 and 93% in 2001 (New York State Department of Health, personal communication, 2002). In Connecticut, an ABC Network review of 668 charts indicated a testing rate of 31% during January 1998–September 1999, compared with 81% of 93 charts reviewed during October-December 1999 after enactment of the mandatory newborn testing law.

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CDC Editorial Note: Prenatal HIV testing affords the best opportunity for the prevention of perinatal HIV transmission. On the basis of clinical trial data, perinatal HIV-transmission rates among HIV-infected women who begin antiretroviral treatment during pregnancy are as low as ≤2%,[6] compared with 12%-13% early transmission rates among women who do not begin preventive treatment until labor and delivery or after birth[7] and 25% among women who receive no preventive treatment.[8]

Among the three prenatal HIV testing approaches assessed in this report, opt-out voluntary testing and the mandatory testing of newborns appear to be associated with the highest testing rates. On the basis of the chart-review methodology, prenatal testing rates were higher in Tennessee, which uses the opt-out approach, than rates in states using the opt-in approach and similar to rates achieved with mandatory newborn testing in New York during the same time period. A similar trend was observed among Canadian provinces. In New York and Connecticut, mandatory HIV testing of newborns was associated with increases in prenatal testing rates. On the basis of PRAMS data, three of seven states using the opt-in approach achieved lower prenatal HIV-testing rates than states using the opt-out or mandatory newborn testing approaches.

Increases in prenatal HIV-testing rates were noted in states that shifted from an opt-in approach to either an opt-out or mandatory newborn testing approach and were probably associated with a greater likelihood that woman were offered HIV testing during prenatal care. Data from the Perinatal Guidelines Project indicated that the majority of women will accept HIV testing if it is recommended by their health-care provider.[9] Perinatal HIV experts and professional organizations have advocated streamlining prenatal HIV pre-test counseling and consent procedures to reduce barriers to the offer of testing by health-care providers.[1,2,10]

The findings in this report are subject to at least seven limitations. First, testing results for each strategy are for all women, and the proportion of HIV-positive women who accepted testing under each strategy is not known. Second, among women who did not receive prenatal testing, the proportion of women who were not tested because they did not seek prenatal care is unknown. Third, among women who did not receive prenatal testing, the proportion of women who were tested at labor and delivery or whose infants were tested at birth is not known. Fourth, maternal self-reported data from PRAMS collected 2-6 months after delivery might be subject to recall bias. Fifth, PRAMS data do not indicate whether a prenatal-care provider was aware of the woman's HIV status. Sixth, among the women interviewed in PRAMS, up to 16% (in Arkansas) indicated they did not know if they had been tested. Finally, chart abstraction can document only prenatal HIV testing recorded in maternal medical records; without such documentation, clinicians might not be aware of the need to offer effective perinatal interventions to infected women and their HIV-exposed infants.

This report emphasizes the need for better data to assess perinatal HIV testing rates in the United States. Ongoing, randomized reviews of prenatal, labor/delivery, and pediatric charts, with a sampling framework ensuring that the sample is representative of the population of women delivering, might provide the most valid approach to assessing a state's progress on perinatal HIV testing and prevention. CDC is working with states with high HIV prevalence rates among women of childbearing age and high numbers of pediatric AIDS cases to ensure standardized monitoring of prenatal testing rates. The data suggest that jurisdictions that use an opt-in approach and that have low prenatal HIV-testing rates should reevaluate their approach.

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Protecting Building Environments From Airborne Chemical, Biologic, or Radiologic Attacks

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IN NOVEMBER 2001, FOLLOWING THE discovery that letters containing *Bacillus anthracis* had been mailed to targeted locations in the United States, the Secretary of the U.S. Department of Health and Human Services requested site assessments of an array of public- and private-sector buildings by a team of engineers and scientists from CDC's National Institute for Occupational Safety and Health (NIOSH). In November 2001, this team assessed six buildings, including a large hospital and medical research facility, a museum, a transportation building, two large office buildings, and an office/laboratory building. In January 2002, additional building assessments were conducted at CDC campuses in Atlanta and, in April 2002, at a large, urban transportation facility. A total of 59 buildings were evaluated during this 5-month period.

The primary goal of these assessments was to determine the vulnerability of building air environments, including heating, ventilation, and air-conditioning (HVAC) systems, to a terrorist attack with chemical, biologic, and radiologic (CBR) agents and to develop cost-effective prevention and control strategies. At each facility, CDC investigators performed onsite evaluations to assess the building's vulnerability to CBR attack from internal and external sources. The investigators also

reviewed security and safety plans at each facility. Facility owners received confidential reports identifying observed vulnerabilities and possible remedial options. Collectively, the field observations and prevention recommendations from the building assessments were combined with input from government and industry experts to identify general guidance that encourages building owners, facility managers, and engineers to review design, operational, and security procedures at their own facilities.

The recommendations include measures that can transform buildings into less attractive targets by increasing the difficulty of introducing a CBR agent, increasing the ability to detect terrorists before they carry out an intended release, and incorporating plans and procedures to mitigate the effects of a CBR release. These recommendations are presented in the recently completed NIOSH guidelines,[1] which address physical security, airflow and filtration, maintenance, program administration, and staff training. The guidelines recommend that building owners and managers first understand their buildings' systems by conducting walk-through inspections of the HVAC, fire protection, life-safety, and other systems. Security measures should be adopted for air intakes and return-air grills, and access to building operation systems and building design information should be restricted. The guidelines also recommend that the emergency capabilities of the systems' operational controls should be assessed, filter efficiency should be evaluated closely, buildings' emergency plans should be updated, and preventive maintenance procedures should be adopted. The guidelines also caution against detrimental actions, such as permanently sealing outdoor air intakes.

The recommendations are intended for building owners, managers, and maintenance personnel responsible for public, private, and government buildings, including hospitals, laboratories, offices, retail facilities, schools, transportation facilities, and public venues. The recommendations do not address single-family or low-occupancy residences or higher-risk facilities such as industrial or military facilities, subway systems, or law-enforcement facilities. Copies of these recommendations are available at http://www.cdc.gov/niosh or by telephone, 800-356-4674.

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Use of Anthrax Vaccine in Response to Terrorism: Supplemental Recommendations of the Advisory Committee on Immunization Practices

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IN DECEMBER 2000, THE ADVISORY COMmittee on Immunization Practices (ACIP) released its recommendations for using anthrax vaccine in the United States.[1] Because of recent terrorist attacks involving the intentional exposure of U.S. civilians to *Bacillus anthracis* spores and concerns that the current anthrax vaccine supply is limited, ACIP developed supplemental recommendations on using anthrax vaccine in response to terrorism. These recommendations supplement the previous ACIP statement in three areas: use of anthrax vaccine for pre-exposure vaccination in the U.S. civilian population, the prevention of anthrax by postexposure prophylaxis (PEP), and recommendations for additional research related to using antimicrobial agents and anthrax vaccine for preventing anthrax.

Use of Anthrax Vaccine for Pre-Exposure Vaccination

In December 2001, the U.S. Department of Health and Human Services obtained a limited supply of anthrax vaccine (BioThrax [formerly Anthrax Vaccine Adsorbed (AVA)], BioPort, Lansing, Michigan), allowing ACIP to reconsider using anthrax vaccine in the U.S. civilian population. ACIP reaffirms that pre-exposure use of anthrax vaccine should be based on a quantifiable risk for exposure.[1] ACIP recommends that groups at risk for repeated exposures to *B. anthracis* spores should be given priority for pre-exposure vaccination. Groups at risk for repeated exposure include laboratory personnel handling environmental specimens (especially powders) and performing confirmatory testing for *B. anthracis* in the U.S. Laboratory Response Network (LRN) for Bioterrorism Level B laboratories or above, workers who will be making repeated entries into known *B. anthracis*-spore–contaminated areas after a terrorist attack,[2] and workers in other settings in which repeated exposure to aerosolized *B. anthracis* spores might occur. Laboratory workers using standard Biosafety Level 2 practices in the routine processing of clinical samples or environmental swabs (Level A laboratories[3]) are not considered by ACIP to be at increased risk for exposure to *B. anthracis* spores.

For persons not at risk for repeated exposures to aerosolized *B. anthracis* spores through their occupation, preexposure vaccination with anthrax vaccine is not recommended. For the general population, prevention of morbidity and mortality associated with anthrax will depend on public vigilance, early detection and diagnosis, appropriate treatment, and PEP.

Prevention of Anthrax by PEP

Because of a potential preventive benefit of combined antimicrobial PEP and vaccine and the availability of a limited supply of anthrax vaccine for civilian use, ACIP endorses CDC making anthrax vaccine available in a 3-dose regimen (0, 2, 4 weeks) in combination with

antimicrobial PEP under an Investigational New Drug (IND) application with the Food and Drug Administration for unvaccinated persons at risk for inhalational anthrax. However, anthrax vaccine is not licensed for postexposure use in preventing anthrax.

Use of anthrax vaccine for PEP could have additional benefits, including reducing the need for long-term antimicrobial therapy with its associated problems of nonadherence and possible adverse events. After the anthrax-related terrorist attacks in 2001, approximately 10,000 persons were recommended to receive a 60-day regimen of antimicrobial prophylaxis for suspected or confirmed exposure to *B. anthracis* spores, but adherence to the recommended 60-day antibiotic regimens was as low as 42%.[4] In addition, because studies of the 2001 terrorist attacks suggest that some persons might be exposed to *B. anthracis* spores in excess of those studied in animal models, the effectiveness of antimicrobial prophylaxis in such persons is unclear.[4] However, no cases of anthrax have been detected among persons recommended to take antimicrobial prophylaxis after the terrorist attacks of 2001.

The provision of anthrax vaccine for PEP under an IND application should provide an opportunity to reduce the risk to the greatest extent possible with current medical knowledge and might provide data to support developing additional recommendations for preventing anthrax. To better document the immunogenicity of anthrax vaccine in the postexposure setting, ACIP encouraged CDC to obtain serologic testing on a subset of vaccinees.

ACIP recommended previously that if antimicrobial therapy is used alone for postexposure prevention of anthrax, at least a 30-day course of treatment should be provided. Previous recommendations noted that longer courses (42-60 days) might be indicated. On the basis of limited data from both unintentional human exposures and animal studies,[5-7] ACIP now recommends that the duration of postexposure antimicrobial prophylaxis should be 60 days if used alone for PEP of unvaccinated exposed persons.

Data are insufficient to clarify the duration of antimicrobial use in combination with vaccine for PEP against anthrax. Antibody titers among vaccinated persons peak at 14 days after the third dose.[8] If antimicrobial prophylaxis is administered in combination with postexposure vaccination, it might be prudent to continue antibiotics until 7-14 days after the third vaccine dose.

Few data exist about the effectiveness of postexposure antimicrobial prophylaxis among exposed persons who have been partially or fully vaccinated. In the only human clinical trial of anthrax vaccine, cases occurred among participants who had received <4 doses.[9] Recognizing these limited data, but considering a potential undefined benefit, ACIP recommends that persons who have been partially or fully vaccinated receive at least a 30-day course of antimicrobial PEP and continue with the licensed vaccination regimen. Antimicrobial PEP is not needed for vaccinated persons working in Biosafety Level 3 laboratories under recommended conditions[10] nor for vaccinated persons (six vaccinations according to the current label) wearing appropriate personal protective equipment (PPE) while working in contaminated environments in which inhalational exposure to *B. anthracis* spores is a risk, unless their respiratory protection is disrupted.

Additional Considerations

For most occupational settings, recommendations about anthrax vaccine and antimicrobial PEP might be implemented in combination with use of appropriate PPE.[2] In addition to receiving PEP for preventing anthrax, potentially exposed persons should be observed for signs of febrile illness. CDC has published guidelines on clinical evaluation of persons with possible anthrax, including antimicrobial treatment.[1,2] Because the current vaccine supply is limited, ACIP recommends expanded and intensive efforts to improve anthrax vaccine production.

Recommendations for Additional Research

Because of the absence of data to guide public health recommendations in these critical areas, ACIP recommends studies on the safety and immunogenicity of anthrax vaccine for use in children, additional studies on the safety of anthrax vaccine during human pregnancy, and reproductive toxicology studies on anthrax vaccine in laboratory animals. To strengthen public health recommendations for PEP, ACIP recommends expanded animal studies to evaluate further the effectiveness of antimicrobial prophylaxis with and without anthrax vaccine, define the optimal duration of antimicrobial PEP for the prevention of inhalational anthrax, and evaluate alternative antimicrobial PEP regimens. Additional research also should be directed toward developing an improved vaccine for preventing anthrax and new therapeutic strategies, including use of antitoxin (e.g., hyperimmune globulin) for treating anthrax.

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